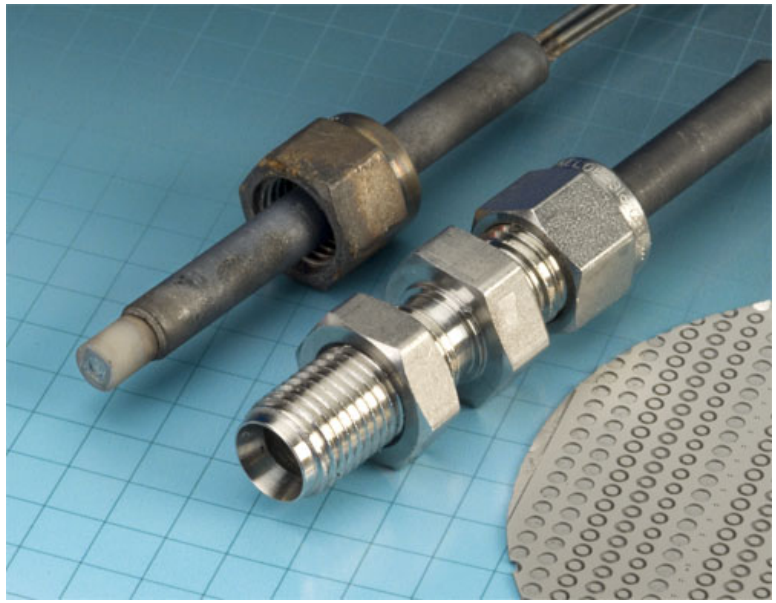
NASA Glenn Success Stories

MEMS-DCA packaging technique and CLASSIC chip fabrication method

Endevco Corporation

TECHNOLOGY

This new packaging method and fabrication technique enables the production of silicon carbide-based (SiC) pressure sensors that can operate reliably in high temperatures and harsh environments. With no need for cooling, the SiC-based pressure sensors produced using these techniques can operate for 130 hours at temperatures up to 600°C.



Sub-assembled SiC MEMS-DCA pressure transducer

COMMERCIAL APPLICATIONS

- Commercial aviation, military aviation, oil and gas drilling, missiles, safe and arm devices, fuzes, space exploration, land- and sea-based vehicles, land-based turbines, and power generation.
- Integrated microsystems for real-time control of the combustion process for improvement in aviation safety and combustion efficiency.

SOCIAL / ECONOMIC BENEFIT

- Improves pressure sensor reliability by eliminating thermo-mechanical stress in traditionally packaged sensors.
- Increases data reliability due to being located in closer proximity to sensed environment compared to conventional silicon-based sensors.
- Lighter weight, less complexity, lower cost, and reduced tear-down cycle for engine maintenance due to elimination of water-cooling plumbing. Also leads to reduced engine weight and improved performance, hence improved fuel efficiency.

NASA APPLICATIONS

- This technology will be used in engine performance diagnostics and active control strategies in NASA's Subsonic, Supersonic, and Hypersonic Projects as well as in future missions to Venus to measure atmospheric pressure.

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